REMARKS

The Office Action mailed December 19, 2007 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 10-20 are now pending in this application. Claims 1-9 have been cancelled. Claims 10-20 stand rejected.

The rejection of Claim 10 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,823,878 to Gadini (hereinafter referred to as "Gadini") in view of U.S. Pat. No. 5,878,603 to Warren, Jr. et al. (hereinafter referred to as "Warren") is respectfully traversed.

Initially, Applicants respectfully traverse the Examiner's assertion at page 4 of the Office Action that "the claimed ratemeter is equivalent to turbine [*sic*] flowmeter of Gadini since both are measuring volume [*sic*] of liquid [*sic*]." Rather, Applicants respectfully submit that the turbine flow meter described in Gadini would not be understood by one of ordinary skill in the art to be equivalent to the turbine ratemeter recited in the presently pending claims. More specifically, Gadini merely describes that a standard turbine flow meter may be used to meter the flow of softened water into a tub. Applicants respectfully submit that one of ordinary skill in the art would understand that a turbine flow meter may have one of several types of outputs, including analog voltage, analog current, frequency or pulse, and switch. Gadini does not describe or suggest what type of signal the standard turbine flow meter outputs although, in one embodiment, Gadini describes a flow sensor that outputs a signal having a gradually increasing value. A signal having a gradually increasing value is not a signal having a plurality of square wave pulses.

In contrast, the ratemeter, as recited in the presently pending claims, counts pulses within a square wave pulse signal. In further contrast to the flow meter and/or flow sensor of Gadini, ratemeters are known in the art as being used to indicate a counting rate. Gadini does not describe or suggest the type of signal the turbine flow meter outputs but, merely, describes that the flow sensor outputs a gradually increasing value. The turbine flow meter and/or the flow sensor described in Gadini do not count a pulse and, as such, are not

equivalent to the recited turbine ratemeter. Accordingly, Gadini does not describe or suggest a turbine ratemeter configured to meter a quantity of water flow through a valve and generate a signal having a plurality of square wave pulses representing the quantity of water flow through the valve, wherein each pulse of the plurality of square wave pulses represents a predetermined quantity of water.

Gadini describes a control system for softening water and channeling the water to a dishwasher. The dishwasher includes a tub (1) and an inlet duct (8) that is in flow communication with a main water supply and the tub (1). A decalcification system (10) is coupled between the inlet duct (8) and the tub (1). The decalcification system (10) includes water-softening resins (R) and a collecting tank (17). The water is channeled from the inlet duct (8) to the tank (17) and the resins (R). Softened water flows from the resins (R) into the tub (1). To regenerate the resins (R), valves (9, 11, 13, 15, 18, and/or 20) control the flow of water from the tank (17) through the resins (R) while preventing water from being discharged into the tub (1). After regeneration, the valves (9, 11, 13, 15, 18, and/or 20) refill the tank (17) and allow softened water to be discharged within the tub (1). A control system controls operation of the tub (1), the tank (17), the decalcification system (10), and the valves (9, 11, 13, 15, 18, and 20). A standard turbine flow meter may be used to meter a flow of water within the tub (1).

Further, a metering tank (26) may be positioned downstream from an air break (AB) in the inlet duct (8). The metering tank (26) meters the flow of water to the tub (1) through a series of supplying and discharging the tank (26) into the collection tank (17) and/or the decalcification system (10). A flow sensor (27), such as a turbine flow-rate sensor, is coupled to the inlet duct (8) upstream from the air break (AB). To supply and discharge the tank (26), a predetermined amount of water required for filling the tanks (17 and 26), the ducts (8, 19, and 12), and the decalcification system (10) is properly coded within suitable memory means of the control system. The amount of water is detected by the flow sensor (27) and is output as a gradually increasing value signal. The control system compares the increasing signal to the predetermined amount stored therein. When the two values coincide, the control system closes the valves (9 and 20).

As discussed above, although Gadini describes that a water flow may be metered using a standard turbine flow meter, Gadini does not describe or suggest the type of output of the turbine flow meter. Further, Gadini describes that the flow sensor (27), which may be a turbine flow-rate sensor, outputs a signal having a gradually increasing value that is compared to a predetermined amount. A gradually increasing value signal is not equivalent to a signal having a plurality of square wave pulses. As such, Gadini does not describe or suggest a turbine ratemeter configured to meter a quantity of water flow through a valve and generate a signal having a plurality of square wave pulses representing the quantity of water flow through the valve, wherein each pulse of the plurality of square wave pulses represents a predetermined quantity of water. Further, as acknowledged by the Examiner at page 4 of the Office Action, Gadini "fails to disclose a water supply line having a first diameter and a restrictor tube having a second diameter."

Warren describes a quiet fill water system for a washing machine (110). The washing machine (110) includes a washing tub (18) having an entry port (32) disposed within an outer wall (20), a valve (12) having a water inlet (22) and a water outlet (24), and a water reservoir (58) coupled to the outer wall (20). The water reservoir (58) includes a tube entry port (64), a cup-shaped body portion (60), and a water flow port (62). The water flow port (62) is mated with the outer wall entry port (32) to provide fluid communication between the water reservoir (58) and the washing tub (18). The washing machine (110) also includes a capillary tube (50) having a first end (52), a second end (56), and a tip portion (66). The first end (52) is coupled to the water outlet (24) of the valve (12), and the second end (56) is positioned within the tube entry port (64) such that the tip portion (66) is within the body portion (60) of the water reservoir (58) at a lower position relative to the water flow port (62). Such configuration forms a quiescent reservoir (70) of water during a fill period to decrease the level of noise of the fill period. Notably, Warren does not describe or suggest a turbine ratemeter configured to meter a quantity of water flow through a valve and generate a signal having a plurality of square wave pulses representing the quantity of water flow through the valve, wherein each pulse of the plurality of square wave pulses represents a predetermined quantity of water.

Claim 10 recites a dishwasher comprising "a wash chamber; a water supply line in flow communication with said wash chamber, said water supply line having a first diameter; a valve configured to deliver water from said water supply line into said wash chamber; a turbine ratemeter in flow communication with said valve, said turbine ratemeter configured to meter a quantity of water flow through said valve and generate a signal comprising a plurality of square wave pulses representing the quantity of water flow through said valve, each pulse of said plurality of square wave pulses representing a predetermined quantity of water; a restrictor tube in flow communication with said turbine ratemeter, said restrictor tube having a second diameter smaller than said first diameter; and a controller in signal communication with said turbine ratemeter, said controller controlling said valve in response to the signal received from the turbine ratemeter."

Neither Gadini nor Warren, considered alone or in combination, describes or suggests a dishwasher as recited in Claim 10. More specifically, neither Gadini nor Warren, considered alone or in combination, describes or suggests a dishwasher that includes a turbine ratemeter in flow communication with a valve, wherein the turbine ratemeter is configured to meter a quantity of water flow through the valve and generate a signal having a plurality of square wave pulses representing the quantity of water flow through the valve, each pulse of the plurality of square wave pulses representing a predetermined quantity of water. Rather, in contrast to the present invention, Gadini merely describes that a standard turbine flow meter may be used to meter a flow of water within a tub of a dishwasher, and Warren describes a capillary tube having a first end coupled to a water outlet of a valve and having a tip portion within a cup-shaped body portion of a water reservoir such that a quiescent reservoir of water is formed within the body portion.

Accordingly, for at least the reasons set forth above, Claim 10 is submitted to be patentable over Gadini in view of Warren.

For at least reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 10 be withdrawn.

The rejection of Claims 11-20 under 35 U.S.C. § 103(a) as being unpatentable over Gadini in view of Warren and U.S. Patent No. 5,330,580 to Whipple, III et al. (hereinafter referred to as "Whipple") is respectfully traversed.

Gadini and Warren are described above. Gadini further describes storing in a control system a predetermined amount of water initially required to fill the tanks (17 and 26), the ducts (8, 19, and 12), and the decalcification system (10). A second water quantity is also stored in the control system. The second water quantity is the difference between a total amount of water to be supplied to the tub (1) during a wash cycle and the predetermined amount of water initially required. The second water quantity is used to refill the metering tank (26) after water has been discharged into the tub (1) from the metering tank (26). The metering tank (26) is serially refilled and discharged until the total amount of water required for a wash cycle has been supplied to the tub (1). As such, the second water quantity corresponds to the same wash cycle to which the predetermined amount of water initially required corresponds. Accordingly, Gadini does not describe or suggest retaining a second total amount of additional water added during *a second dishwashing cycle* and/or determining a second amount of water to deliver to a dishwasher for *a third dishwashing cycle* subsequent the second cycle.

Whipple describes a dishwasher (10) that includes a device (60) having a sensor for detecting power consumption surges of a pump motor (75) as a frame (20) receives water channeled from a water source through a valve (30). A pump (70) having the pump motor (75) is used to supply water to the frame (20). The power consumption surges are generated by cavitation within the water, which indicates that less than a sufficient amount of water has been received by the frame (20) for a particular wash cycle. The device (60) uses a controller (200) to control the valve (30) to channel an amount of additional water through the valve (30) such that the cavitation is reduced. The cavitation of the water and the power consumption of the pump motor (75) are reduced as the frame (20) receives an amount of water sufficient for the wash cycle.

As acknowledged by the Examiner at page 5 of the Office Action, Whipple does not describe or suggest a turbine ratemeter. As such, Whipple does not overcome the deficiencies of Gadini and Warren.

Claims 11-13 depend from independent Claim 10, which is recited above.

None of Gadini, Warren, and Whipple, considered alone or in combination, describes or suggests a dishwasher as recited in Claim 10. More specifically, none of Gadini, Warren, and Whipple, considered alone or in combination, describes or suggests a dishwasher that includes a turbine ratemeter in flow communication with a valve, wherein the turbine ratemeter is configured to meter a quantity of water flow through the valve and generate a signal having a plurality of square wave pulses representing the quantity of water flow through the valve, each pulse of the plurality of square wave pulses representing a predetermined quantity of water. Rather, in contrast to the present invention, Gadini merely describes that a standard turbine flow meter may be used to meter a flow of water within a tub of a dishwasher, Warren describes a capillary tube having a first end coupled to a water outlet of a valve and having a tip portion within a cup-shaped body portion of a water reservoir such that a quiescent reservoir of water is formed within the body portion, and Whipple describes sensing cavitation in a pump motor and controlling a valve to supply an amount of additional water to a dishwasher to reduce the cavitation.

Accordingly, for at least the reasons set forth above, Claim 10 is respectfully submitted to be patentable over Gadini in view of Warren and Whipple.

When the recitations of Claims 11-13 are considered in combination with the recitations of Claim 10, Applicants submit that Claims 11-13 likewise are patentable over Gadini in view of Warren and Whipple.

Claim 14 recites a dishwasher comprising "a wash chamber; a water supply line in flow communication with said wash chamber, said water supply line having a first diameter; a valve and a turbine ratemeter positioned to deliver a metered amount of water into said wash chamber, said turbine ratemeter generating a plurality of square wave pulses each

representing a predetermined quantity of water; a restrictor tube in flow communication with said turbine ratemeter, said restrictor tube having a second diameter smaller than said first diameter; and a controller coupled to said valve and said turbine ratemeter, said controller configured to: deliver a first amount of water to the dishwasher for a first dishwashing cycle; monitor at least one operation of the dishwasher during the first dishwashing cycle to detect an underfill condition; add additional water to the dishwasher upon detecting at least one underfill condition during the first dishwashing cycle; retain a first total amount of additional water added during the first dishwashing cycle; deliver the first amount of water to the dishwasher for a second dishwashing cycle subsequent the first cycle; monitor at least one operation of the dishwasher during the second dishwashing cycle to detect an underfill condition; add additional water to the dishwasher upon detecting at least one underfill condition during the second dishwasher cycle; retain a second total amount of additional water added during the second dishwashing cycle; and determine a second amount of water to deliver to the dishwasher for a third dishwashing cycle subsequent the second cycle using the retained first total amount of additional water added and the retained second total amount of additional water added."

None of Gadini, Warren, and Whipple, considered alone or in combination, describes or suggests a dishwasher as recited in Claim 14. More specifically, none of Gadini, Warren, and Whipple, considered alone or in combination, describes or suggests a dishwasher that includes a turbine ratemeter positioned to deliver a metered amount of water into a wash chamber, wherein the turbine ratemeter generates a plurality of square wave pulses each representing a predetermined quantity of water. Moreover, none of Gadini, Warren, and Whipple, considered alone or in combination, describes or suggests a dishwasher that includes a controller configured to retain a second total amount of additional water added during a second dishwashing cycle and/or determine a second amount of water to deliver to a dishwasher for a third dishwashing cycle subsequent the second cycle. Rather, in contrast to the present invention, Gadini merely describes that a standard turbine flow meter may be used to meter a flow of water within a tub of a dishwasher, Warren describes a capillary tube having a first end coupled to a water outlet of a valve and having a tip portion within a cup-shaped body portion of a water reservoir such that a quiescent reservoir of water is formed

within the body portion, and Whipple describes sensing cavitation in a pump motor and controlling a valve to supply an amount of additional water to a dishwasher to reduce the cavitation.

Accordingly, for at least the reasons set forth above, Claim 14 is respectfully submitted to be patentable over Gadini in view of Warren and Whipple.

Claims 15-20 depend from independent Claim 14. When the recitations of Claims 15-20 are considered in combination with the recitations of Claim 14, Applicants submit that Claims 15-20 likewise are patentable over Gadini in view of Warren and Whipple.

For at least reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 11-20 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,

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